

THE DELICATE BALANCE OF TERROR

By Albert Wohlstetter

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THE first shock administered by the Soviet launching of sputnik has almost dissipated. The flurry of statements and investigations and improvised responses has died down, leaving a small residue: a slight increase in the schedule of bomber and ballistic missile production, with a resulting small increment in our defense expenditures for the current fiscal year; a considerable enthusiasm for space travel; and some stirrings of interest in the teaching of mathematics and physics in the secondary schools. Western defense policy has almost returned to the level of activity and the emphasis suited to the basic assumptions which were controlling before sputnik.

One of the most important of these assumptions—that a general thermonuclear war is extremely unlikely—is held in common by most of the critics of our defense policy as well as by its proponents. Because of its crucial rôle in the Western strategy of defense, I should like to examine the stability of the thermonuclear balance which, it is generally supposed, would make aggression irrational or even insane. The balance, I believe, is in fact precarious, and this fact has critical implications for policy. Deterrence in the 1960s is neither assured nor impossible but will be the product of sustained intelligent effort and hard choices, responsibly made. As a major illustration important both for defense and foreign policy, I shall treat the particularly stringent conditions for deterrence which affect forces based close to the enemy, whether they are U.S. forces or those of our allies, under single or joint control. I shall comment also on the inadequacy as well as the necessity of deterrence, on the problem of accidental outbreak of war, and on disarmament.¹

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II. THE PRESUMED AUTOMATIC BALANCE

I emphasize that requirements for deterrence are stringent. We have heard so much about the atomic stalemate and the receding probability of war which it has produced that this may strike the reader as something of an exaggeration. Is deterrence a necessary consequence of both sides having a nuclear delivery capability,

¹ I want to thank C. J. Hitch, M. W. Hoag, W. W. Kaufman, A. W. Marshall, H. S. Rowen and W. W. Taylor for suggestions in preparation of this article.

and is all-out war nearly obsolete? Is mutual extinction the only outcome of a general war? This belief, frequently expressed by references to Mr. Oppenheimer's simile of the two scorpions in a bottle, is perhaps the prevalent one. It is held by a very eminent and diverse group of people—in England by Sir Winston Churchill, P. M. S. Blackett, Sir John Slessor, Admiral Buzzard and many others; in France by such figures as Raymond Aron, General Gallois and General Gazin; in this country by the titular heads of both parties as well as almost all writers on military and foreign affairs, by both Henry Kissinger and his critic, James E. King, Jr., and by George Kennan as well as Dean Acheson. Mr. Kennan refers to American concern about surprise attack as simply obsessive;² and many people have drawn the consequence of the stalemate as has Blackett, who states: "If it is in fact true, as most current opinion holds, that strategic air power has abolished global war, then an urgent problem for the West is to assess how little effort must be put into it to keep global war abolished."³ If peace were founded firmly on mutual terror, and mutual terror on symmetrical nuclear capabilities, this would be, as Churchill has said, "a melancholy paradox;" none the less a most comforting one.

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Deterrence, however, is not automatic. While feasible, it will be much harder to achieve in the 1960s than is generally believed. One of the most disturbing features of current opinion is the underestimation of this difficulty. This is due partly to a misconstruction of the technological race as a problem in matching striking forces, partly to a wishful analysis of the Soviet ability to strike first.

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Since sputnik, the United States has made several moves to assure the world (that is, the enemy, but more especially our allies and ourselves) that we will match or overmatch Soviet technology and, specifically, Soviet offense technology. We have, for example, accelerated the bomber and ballistic missile programs, in particular the intermediate-range ballistic missiles. The problem has been conceived as more or better bombers—or rockets; or sputniks; or engineers. This has meant confusing deterrence with matching or exceeding the enemy's ability to strike first. Matching weapons, however, misconstrues the nature of the technological race. Not, as is frequently said, because only a few bombs

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² George F. Kennan, "A Chance to Withdraw Our Troops in Europe," *Harper's Magazine*, February 1958, p. 41.

³ P. M. S. Blackett, "Atomic Weapons and East-West Relations" (New York: Cambridge University Press, 1956), p. 32.

owned by the defender can make aggression fruitless, but because even many might not. One outmoded A-bomb dropped from an obsolete bomber might destroy a great many supersonic jets and ballistic missiles. To deter an attack means being able to strike back in spite of it. It means, in other words, a capability to strike second. In the last year or two there has been a growing awareness of the importance of the distinction between a "strike-first" and a "strike-second" capability, but little, if any, recognition of the implications of this distinction for the balance of terror theory.

Where the published writings have not simply underestimated Soviet capabilities and the advantages of a first strike, they have in general placed artificial constraints on the Soviet use of the capabilities attributed to them. They assume, for example, that the enemy will attack in mass over the Arctic through our Distant Early Warning line, with bombers refueled over Canada—all resulting in plenty of warning. Most hopefully, it is sometimes assumed that such attacks will be preceded by days of visible preparations for moving ground troops. Such assumptions suggest that the Soviet leaders will be rather bumbling or, better, coöperative. However attractive it may be for us to narrow Soviet alternatives to these, they would be low in the order of preference of any reasonable Russians planning war.

III. THE QUANTITATIVE NATURE OF THE PROBLEM AND THE UNCERTAINTIES

In treating Soviet strategies it is important to consider Soviet rather than Western advantage and to consider the strategy of both sides quantitatively. The effectiveness of our own choices will depend on a most complex numerical interaction of Soviet and Western plans. Unfortunately, both the privileged and unprivileged information on these matters is precarious. As a result, competent people have been led into critical error in evaluating the prospects for deterrence. Western journalists have greatly overestimated the difficulties of a Soviet surprise attack with thermonuclear weapons and vastly underestimated the complexity of the Western problem of retaliation.

One intelligent commentator, Richard Rovere, recently expressed the common view: "If the Russians had ten thousand warheads and a missile for each, and we had ten hydrogen bombs and ten obsolete bombers, . . . aggression would still be a folly that would appeal only to an insane adventurer." Mr. Rovere's exam-

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ple is plausible because it assumes implicitly that the defender's hydrogen bombs will with certainty be visited on the aggressor; then the damage done by the ten bombs seems terrible enough for deterrence, and any more would be simply redundant. This is the basis for the common view. The example raises questions, even assuming the delivery of the ten weapons. For instance, the targets aimed at in retaliation might be sheltered and a quite modest civil defense could hold within tolerable limits the damage done to such city targets by ten delivered bombs. But the essential point is that the weapons would not be very likely to reach their targets. Even if the bombers were dispersed at ten different points, and protected by shelters so blast resistant as to stand up anywhere outside the lip of the bomb crater—even inside the fire ball itself—the chances of one of these bombers surviving the huge attack directed at it would be on the order of one in a million. (This calculation takes account of the unreliability and inaccuracy of the missile.) And the damage done by the small minority of these ten planes that might be in the air at the time of the attack, armed and ready to run the gauntlet of an alert air defense system, if not zero, would be very small indeed compared to damage that Russia has suffered in the past. For Mr. Rovere, like many other writers on this subject, numerical superiority is not important at all.

For Joseph Alsop, on the other hand, it is important, but the superiority is on our side. Mr. Alsop recently enunciated as one of the four rules of nuclear war: "The aggressor's problem is astronomically difficult; and the aggressor requires an overwhelming superiority of force."⁴ There are, he believes, no fewer than 400 SAC bases in the NATO nations alone and many more elsewhere, all of which would have to be attacked in a very short space of time. The "thousands of coördinated air sorties and/or missile firings," he concludes, are not feasible. Mr. Alsop's argument is numerical and has the virtue of demonstrating that at least the relative numbers are important. But the numbers he uses are very wide of the mark. He overestimates the number of such bases by a factor of more than ten,⁵ and in any case, missile firings on the scale of a thousand or more involve costs that are by no means out of proportion, given the strategic budgets of the

⁴ Joseph Alsop, "The New Balance of Power," *Encounter*, May 1958, p. 4. It should be added that, since these lines were written, Mr. Alsop's views have altered.

⁵ *The New York Times*, September 6, 1958, p. 2.

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great powers. Whether or not thousands are needed depends on the yield and the accuracy of the enemy missiles, something about which it would be a great mistake for us to display confidence.

Perhaps the first step in dispelling the nearly universal optimism about the stability of deterrence would be to recognize the difficulties in analyzing the uncertainties and interactions between our own wide range of choices and the moves open to the Soviets. On our side we must consider an enormous variety of strategic weapons which might compose our force, and for each of these several alternative methods of basing and operation. These are the choices that determine whether a weapons system will have any genuine capability in the realistic circumstances of a war. Besides the B-47E and the B-52 bombers which are in the United States strategic force now, alternatives will include the B-52G (a longer-range version of the B-52); the Mach 2 B-58A bomber and a "growth" version of it; the Mach 3 B-70 bomber; a nuclear-powered bomber possibly carrying long-range air-to-surface missiles; the Dynasoar, a manned glide-rocket; the Thor and the Jupiter, liquid-fueled intermediate-range ballistic missiles; the Snark intercontinental cruise missile; the Atlas and the Titan intercontinental ballistic missiles; the submarine-launched Polaris and Atlantis rockets; and Minuteman, one potential solid-fueled successor to the Thor and Titan; possibly unmanned bombardment satellites; and many others which are not yet gleams in anyone's eye and some that are just that.

The difficulty of describing in a brief article the best mixture of weapons for the long-term future beginning in 1960, their base requirements, their potentiality for stabilizing or upsetting the balance among the great powers, and their implications for the alliance, is not just a matter of space or the constraint of security. The difficulty in fact stems from some rather basic insecurities. These matters are wildly uncertain; we are talking about weapons and vehicles that are some time off and, even if the precise performances currently hoped for and claimed by contractors were in the public domain, it would be a good idea to doubt them.

Recently some of my colleagues picked their way through the graveyard of early claims about various missiles and aircraft: their dates of availability, costs and performance. These claims are seldom revisited or talked about: *de mortuis nil nisi bonum*. The errors were large and almost always in one direction. And the less we knew, the more hopeful we were. Accordingly the missiles

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benefited in particular. For example, the estimated cost of one missile increased by a factor of over 50—from about \$35,000 in 1949 to some \$2 million in 1957. This uncertainty is critical. Some but not all of the systems listed can be chosen and the problem of choice is essentially quantitative. The complexities of the problem, if they were more widely understood, would discourage the oracular confidence of writers on the subject of deterrence.

Some of the complexities can be suggested by referring to the successive obstacles to be hurdled by any system providing a capability to strike second, that is, to strike back. Such deterrent systems must have (a) a stable, "steady-state" peacetime operation within feasible budgets (besides the logistic and operational costs there are, for example, problems of false alarms and accidents). They must have also the ability (b) to survive enemy attacks, (c) to make and communicate the decision to retaliate, (d) to reach enemy territory with fuel enough to complete their mission, (e) to penetrate enemy active defenses, that is, fighters and surface-to-air missiles, and (f) to destroy the target in spite of any "passive" civil defense in the form of dispersal or protective construction or evacuation of the target itself.

Within limits the enemy is free to use his offensive and defensive forces so as to exploit the weaknesses of each of our systems. He will also be free, within limits, in the 1960s to choose that composition of forces which will make life as difficult as possible for the various systems we might select. It would be quite wrong to assume that we have the same degree of flexibility or that the uncertainties I have described affect a totalitarian aggressor and the party attacked equally. A totalitarian country can preserve secrecy about the capabilities and disposition of his forces very much better than a Western democracy. And the aggressor has, among other enormous advantages of the first strike, the ability to weigh continually our performance at each of the six barriers and to choose that precise time and circumstance for attack which will reduce uncertainty. It is important not to confuse our uncertainty with his. Strangely enough, some military commentators have not made this distinction and have founded their certainty of deterrence on the fact simply that there are uncertainties.

Unwarranted optimism is displayed not only in the writings of journalists but in the more analytic writings of professionals. The recent writings of General Gallois⁶ parallel rather closely

⁶ General Pierre M. Gallois, "A French General Analyzes Nuclear-Age Strategy," *Réalités*, Nov. 1958, p. 19; "Nuclear Aggression and National Suicide," *The Reporter*, Sept. 18, 1958, p. 23.

Mr. Alsop's faulty numerical proof that surprise attack is astronomically difficult—except that Gallois' "simple arithmetic," to borrow his own phrase, turns essentially on some assumptions which are at once inexplicit and extremely optimistic with respect to the blast resistance of dispersed missile sites subjected to attack from relatively close range.⁷ Mr. Blackett's recent book, "Atomic Weapons and East-West Relations," illustrates the hazards confronting a most able analyst in dealing with the piecemeal information available to the general public. Mr. Blackett, a Nobel prize-winning physicist with wartime experience in military operations research, lucidly summarized the public information available when he was writing in 1956 on weapons for all-out war. But much of his analysis was based on the assumption that H-bombs could not be made small enough to be carried in an intercontinental missile. It is now widely known that intercontinental ballistic missiles will have hydrogen warheads, and this fact, a secret at the time, invalidates Mr. Blackett's calculations and, I might say, much of his optimism on the stability of the balance of terror. In sum, one of the serious obstacles to any widespread rational judgment on these matters of high policy is that critical elements of the problem *have* to be protected by secrecy. However, some of the principal conclusions about deterrence in the early 1960s can be fairly firmly based, and based on public information.

IV. THE DELICACY OF THE BALANCE OF TERROR

The most important conclusion is that we must expect a vast increase in the weight of attack which the Soviets can deliver with little warning, and the growth of a significant Russian capability for an essentially warningless attack. As a result, strategic deterrence, while feasible, will be extremely difficult to achieve, and at critical junctures in the 1960s, we may not have the power to deter attack. Whether we have it or not will depend on some difficult strategic choices as to the future composition of the deterrent forces as well as hard choices on its basing, operations and defense. WRONG
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Manned bombers will continue to make up the predominant part of our striking force in the early 1960s. None of the popular remedies for their defense will suffice—not, for example, mere increase of alertness (which will be offset by the Soviet's increasing capability for attack without significant warning), nor simple

⁷ See footnote, p. 228.

dispersal or sheltering alone or mobility taken by itself, nor a mere piling up of interceptors and defense missiles around SAC bases. Especially extravagant expectations have been placed on the airborne alert—an extreme form of defense by mobility. The impression is rather widespread that one-third of the SAC bombers are in the air and ready for combat at all times.⁸ This belief is belied by the public record. According to the Symington Committee Hearings in 1956, our bombers averaged 31 hours of flying per month, which is about 4 percent of the average 732-hour month. An Air Force representative expressed the hope that within a couple of years, with an increase in the ratio of crews to aircraft, the bombers would reach 45 hours of flight per month—which is 6 percent. This 4 to 6 percent of the force includes bombers partially fueled and without bombs. It is, moreover, only an average, admitting variance down as well as up. Some increase in the number of armed bombers aloft is to be expected. However, for the current generation of bombers, which have been designed for speed and range rather than endurance, a continuous air patrol for one-third of the force would be extremely expensive.

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On the other hand, it would be unwise to look for miracles in the new weapons systems, which by the mid-1960s may constitute a considerable portion of the United States force. After the Thor, Atlas and Titan there are a number of promising developments. The solid-fueled rockets, Minuteman and Polaris, promise in particular to be extremely significant components of the deterrent force. Today they are being touted as making the problem of deterrence easy to solve and, in fact, guaranteeing its solution. But none of the new developments in vehicles is likely to do that. For the complex job of deterrence, they all have limitations. The unvaryingly immoderate claims for each new weapons system should make us wary of the latest “technological breakthroughs.” Only a very short time ago the ballistic missile itself was supposed to be intrinsically invulnerable on the ground. It is now more generally understood that its survival is likely to depend on a variety of choices in its defense.

It is hard to talk with confidence about the mid and late-1960s. A systematic study of an optimal or a good deterrent force which considered all the major factors affecting choice and dealt ade-

⁸ See, for example, “NATO, A Critical Appraisal,” by Gardner Patterson and Edgar S. Furniss, Jr., Princeton University Conference on NATO, Princeton, June 1957, p. 32: “Although no one pretended to know, the hypothesis that one-third of the striking force of the United States Strategic Air Command was in the air at all times was regarded by most as reasonable.”

quately with the uncertainties would be a formidable task. In lieu of this, I shall mention briefly why none of the many systems available or projected dominates the others in any obvious way. My comments will take the form of a swift run-through of the characteristic advantages and disadvantages of various strategic systems at each of the six successive hurdles mentioned earlier.

The first hurdle to be surmounted is the attainment of a stable, steady-state peacetime operation. Systems which depend for their survival on extreme decentralization of controls, as may be the case with large-scale dispersal and some of the mobile weapons, raise problems of accidents and over a long period of peacetime operation this leads in turn to serious political problems. Systems relying on extensive movement by land, perhaps by truck caravan, are an obvious example; the introduction of these on European roads, as is sometimes suggested, would raise grave questions for the governments of some of our allies. Any extensive increase in the armed air alert will increase the hazard of accident and intensify the concern already expressed among our allies. Some of the proposals for bombardment satellites may involve such hazards of unintended bomb release as to make them out of the question.

The cost to buy and operate various weapons systems must be seriously considered. Some systems buy their ability to negotiate a given hurdle—say, surviving the enemy attack—only at prohibitive cost. Then the number that can be bought out of a given budget will be small and this will affect the relative performance of competing systems at various other hurdles, for example penetrating enemy defenses. Some of the relevant cost comparisons, then, are between competing systems; others concern the extra costs to the enemy of canceling an additional expenditure of our own. For example, some dispersal is essential, though usually it is expensive; if the dispersed bases are within a warning net, dispersal can help to provide warning against some sorts of attack, since it forces the attacker to increase the size of his raid and so makes it more liable to detection as well as somewhat harder to coördinate. But as the sole or principal defense of our offensive force, dispersal has only a brief useful life and can be justified financially only up to a point. For against our costs of construction, maintenance and operation of an additional base must be set the enemy's much lower costs of delivering one extra weapon. And, in general, any feasible degree of dispersal leaves a consider-

able concentration of value at a single target point. For example, a squadron of heavy bombers costing, with their associated tankers and penetration aids, perhaps \$500,000,000 over five years, might be eliminated, if it were otherwise unprotected, by an enemy intercontinental ballistic missile costing perhaps \$16,000,000. After making allowance for the unreliability and inaccuracy of the missile, this means a ratio of some ten for one or better. To achieve safety by *brute* numbers in so unfavorable a competition is not likely to be viable economically or politically. However, a viable peacetime operation is only the first hurdle to be surmounted.

At the second hurdle—surviving the enemy offense—ground alert systems placed deep within a warning net look good against a manned bomber attack, much less good against intercontinental ballistic missiles, and not good at all against ballistic missiles launched from the sea. In the last case, systems such as the Minuteman, which may be sheltered and dispersed as well as alert, would do well. Systems involving launching platforms which are mobile and concealed, such as Polaris submarines, have particular advantage for surviving an enemy offense.

However, there is a third hurdle to be surmounted—namely that of making the decision to retaliate and communicating it. Here, Polaris, the combat air patrol of B-52s, and in fact all of the mobile platforms—under water, on the surface, in the air and above the air—have severe problems. Long distance communication may be jammed and, most important, communication centers may be destroyed.

At the fourth hurdle—ability to reach enemy territory with fuel enough to complete the mission—several of our short-legged systems have operational problems such as coordination with tankers and using bases close to the enemy. For a good many years to come, up to the mid-1960s in fact, this will be a formidable hurdle for the greater part of our deterrent force. The next section of this article deals with this problem at some length.

The fifth hurdle is the aggressor's long-range interceptors and close-in missile defenses. To get past these might require large numbers of planes and missiles. (If the high cost of overcoming an earlier obstacle—using extreme dispersal or airborne alert or the like—limits the number of planes or missiles bought, our capability is likely to be penalized disproportionately here.) Or getting through may involve carrying heavy loads of radar decoys, electronic jammers and other aids to defense penetration. For exam-

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ple, vehicles like Minuteman and Polaris, which were made small to facilitate dispersal or mobility, may suffer here because they can carry fewer penetration aids.

At the final hurdle—destroying the target in spite of the passive defenses that may protect it—low-payload and low-accuracy systems, such as Minuteman and Polaris, may be frustrated by blast-resistant shelters. For example, five half-megaton weapons with an average inaccuracy of two miles might be expected to destroy half the population of a city of 900,000, spread over 40 square miles, provided the inhabitants are without shelters. But if they are provided with shelters capable of resisting overpressures of 100 pounds per square inch, approximately 60 such weapons would be required; and deep rock shelters might force the total up to over a thousand. *come on*

Prizes for a retaliatory capability are not distributed for getting over one of these jumps. A system must get over all six. I hope these illustrations will suggest that assuring ourselves the power to strike back after a massive thermonuclear surprise attack is by no means as automatic as is widely believed.

In counteracting the general optimism as to the ease and, in fact, the inevitability of deterrence, I should like to avoid creating the extreme opposite impression. Deterrence demands hard, continuing, intelligent work, but it can be achieved. The job of deterring rational attack by guaranteeing great damage to an aggressor is, for example, very much less difficult than erecting a nearly airtight defense of cities in the face of full-scale thermonuclear surprise attack. Protecting manned bombers and missiles is much easier because they may be dispersed, sheltered or kept mobile, and they can respond to warning with greater speed. Mixtures of these and other defenses with complementary strengths can preserve a powerful remainder after attack. Obviously not all our bombers and missiles need to survive in order to fulfill their mission. To preserve the majority of our cities intact in the face of surprise attack is immensely more difficult, if not impossible. (This does not mean that the aggressor has the same problem in preserving his cities from retaliation by a poorly-protected, badly-damaged force. And it does not mean that we should not do more to limit the extent of the catastrophe to our cities in case deterrence fails. I believe we should.) Deterrence, however, provided we work at it, is feasible, and, what is more, it is a crucial objective of national policy.

What can be said, then, as to whether general war is unlikely? Would not a general thermonuclear war mean "extinction" for the aggressor as well as the defender? "Extinction" is a state that badly needs analysis. Russian casualties in World War II were more than 20,000,000. Yet Russia recovered extremely well from this catastrophe. There are several quite plausible circumstances in the future when the Russians might be quite confident of being able to limit damage to considerably less than this number—if they make sensible strategic choices and we do not. On the other hand, the risks of not striking might at some juncture appear very great to the Soviets, involving, for example, disastrous defeat in peripheral war, loss of key satellites with danger of revolt spreading—possibly to Russia itself—or fear of an attack by ourselves. Then, striking first, by surprise, would be the sensible choice for them, and from their point of view the smaller risk.

It should be clear that it is not fruitful to talk about the likelihood of general war without specifying the range of alternatives that are pressing on the aggressor and the strategic postures of both the Soviet bloc and the West. Deterrence is a matter of comparative risks. The balance is not automatic. First, since thermonuclear weapons give an enormous advantage to the aggressor, it takes great ingenuity and realism at any given level of nuclear technology to devise a stable equilibrium. And second, this technology itself is changing with fantastic speed. Deterrence will require an urgent and continuing effort.

V. THE USES AND RISKS OF BASES CLOSE TO THE SOVIETS

It may now be useful to focus attention on the special problems of deterrent forces close to the Soviet Union. First, overseas areas have played an important rôle in the past and have a continuing though less certain rôle today. Second, the recent acceleration of production of intermediate-range ballistic missiles and the negotiation of agreements with various NATO powers for their basing and operation have given our overseas bases a renewed importance in deterring attack on the United States—or so it would appear at first blush. Third, an analysis can throw some light on the problems faced by our allies in developing an independent ability to deter all-out attack on themselves, and in this way it can clarify the much agitated question of nuclear sharing. Finally, overseas bases affect in many critical ways, political and economic as well as military, the status of the alliance.

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At the end of the last decade, overseas bases appeared to be an advantageous means of achieving the radius extension needed by our short-legged bombers, of permitting them to use several axes of attack, and of increasing the number of sorties possible in the course of an extended campaign. With the growth of our own thermonuclear stockpile, it became apparent that a long campaign involving many re-uses of a large proportion of our bombers was not likely to be necessary. With the growth of a Russian nuclear-delivery capability, it became clear that this was most unlikely to be feasible.

Our overseas bases now have the disadvantage of high vulnerability. Because they are closer than the United States to the Soviet Union, they are subject to a vastly greater attack by a larger variety as well as number of vehicles. With given resources, the Soviets might deliver on nearby bases a freight of bombs with something like 50 to 100 times the yield that they could muster at intercontinental range. Missile accuracy would more than double. Because there is not much space for obtaining warning—in any case, there are no deep-warning radar nets—and, since most of our overseas bases are close to deep water from which submarines might launch missiles, the warning problem is very much more severe than for bases in the interior of the United States.

As a result, early in the 1950s the U.S. Air Force decided to recall many of our bombers to the continental United States and to use the overseas bases chiefly for refueling, particularly post-strike ground refueling. This reduced drastically the vulnerability of U.S. bombers and at the same time retained many of the advantages of overseas operation. For some years now SAC has been reducing the number of aircraft usually deployed overseas. The purpose is to reduce vulnerability and has little to do with any increasing radius of SAC aircraft. The early B-52 radius is roughly that of the B-36; the B-47, roughly that of the B-50 or B-29. In fact the radius limitation and therefore the basing requirements we have discussed will not change substantially for some time to come. We can talk with comparative confidence here, because the U.S. strategic force is itself largely determined for this period. Such a force changes more slowly than is generally realized. The vast majority of the force will consist of manned bombers, and most of these will be of medium range. Some U.S. bombers will be able to reach some targets from some U.S. bases

within the 48 states without landing on the way back. On the other hand, some bomber-target combinations are not feasible without pre-target landing (and are therefore doubtful). The Atlas, Titan and Polaris rockets, when available, can of course do without overseas bases (though the proportion of Polaris submarines kept at sea can be made larger by the use of submarine tenders based overseas). But even with the projected force of aerial tankers, the greater part of our force, which will be manned bombers, cannot be used at all in attacks on the Soviet Union without at least some use of overseas areas.

What of the bases for Thor and Jupiter, our first intermediate-range ballistic missiles? These have to be close to the enemy, and they must of course be operating bases, not merely refueling stations. The Thors and Jupiters will be continuously in range of an enormous Soviet potential for surprise attack. These installations therefore re-open, in a most acute form, some of the serious questions of ground vulnerability that were raised about six years ago in connection with our overseas bomber bases. The decision to station the Thor and Jupiter missiles overseas has been our principal public response to the Russian advances in rocketry, and perhaps our most plausible response. Because it involves our ballistic missiles it appears directly to answer the Russian rockets. Because it involves using European bases, it appears to make up for the range superiority of the Russian intercontinental missile. And most important, it directly involves the NATO powers and gives them an element of control.

There is no question that it was genuinely urgent not only to meet the Russian threat but to do so visibly, in order to save the loosening NATO alliance. Our allies were fearful that the Soviet ballistic missiles might mean that we were no longer able or willing to retaliate against the Soviet Union in case of an attack on them. We hastened to make public a reaction which would restore their confidence. This move surely appears to increase our own power to strike back, and also to give our allies a deterrent of their own, independent of our decision. It has also been argued that in this respect it merely advances the inevitable date at which our allies will acquire "modern" weapons of their own, and that it widens the range of Soviet challenges which Europe can meet. But we must face seriously the question whether this move will in fact assure either the ability to retaliate or the decision to attempt it, on the part of our allies or ourselves. And we should ask at the

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very least whether further expansion of this policy will buy as much retaliatory power as other ways of spending the considerable sums involved. Finally, it is important to be clear whether the Thor and Jupiter actually increase the flexibility or range of response available to our allies.

One justification for this move is that it disperses retaliatory weapons and that this is the most effective sanction against the thermonuclear aggressor. The limitations of dispersal have already been discussed, but it remains to examine the argument that overseas bases provide *widespread* dispersal, which imposes on the aggressor insoluble problems of coördination.

There is of course something in the notion that forcing the enemy to attack many political entities increases the seriousness of his decision, but there is very little in the notion that dispersal in several countries makes the problem of destruction more difficult in the military sense. Dispersal does not require separation by the distance of oceans—just by the lethal diameters of enemy bombs. And the task of coördinating bomber attacks on Europe and the eastern coast of the United States, say, is not appreciably more difficult than coördinating attacks on our east and west coasts. In the case of ballistic missiles, the elapsed time from firing to impact on the target can be calculated with high accuracy. Although there will be some failures and delays, times of firing can be arranged so that impact on many dispersed points is almost simultaneous—on Okinawa and the United Kingdom, for instance, as well as on California and Ohio. Moreover, it is important to keep in mind that these far-flung bases, while distant from each other and from the United States, are on the whole close to the enemy. To eliminate them, therefore, requires a smaller expenditure of resources on his part than targets at intercontinental range. For close-in targets he can use a wider variety of weapons carrying larger payloads and with higher accuracy.

The seeming *appositeness* of an overseas-based Thor and Jupiter as an answer to a Russian intercontinental ballistic missile stems not so much from any careful analysis of their retaliatory power under attack as from the directness of the comparison they suggest: a rocket equals a rocket, an intercontinental missile equals an intermediate-range missile based at closer range to the target. But this again mistakes the nature of the technological race. It conceives the problem of deterrence as that of simply matching or exceeding the aggressor's capability to strike first.

A surprising proportion of the debate on defense policy has betrayed this confusion. Matching technological developments are useful for prestige, and such demonstrations have a vital function in preserving the alliance and in reassuring the neutral powers. But propaganda is not enough. The only reasonably certain way of maintaining a reputation for strength is to display an actual power to our friends as well as our enemies. We should ask, then, whether further expansion of the current programs for basing Thor and Jupiter is an efficient way to increase American retaliatory power. If overseas bases are considered too vulnerable for manned bombers, will not the same be true for missiles?

The basis for the hopeful impression that they will not is rather vague, including a mixture of hypothetical properties of ballistic missiles in which perhaps the dominant element is their supposedly much more rapid, "push-button" response. What needs to be considered here are the response time of such missiles (including decision, preparation and launch times), and how they are to be defended.

The decision to fire a missile with a thermonuclear warhead is much harder to make than a decision simply to start a manned aircraft on its way, with orders to return to base unless instructed to continue to its assigned target. This is the "fail-safe" procedure practised by the U.S. Air Force. In contrast, once a missile is launched, there is no method of recall or deflection which is not subject to risks of electronic or mechanical failure. Therefore such a decision must wait for much more unambiguous evidence of enemy intentions. It must and will take a longer time to make and is less likely to be made at all. Where more than one country is involved, the joint decision is harder still, since there is opportunity to disagree about the ambiguity of the evidence, as well as to reach quite different interpretations of national interest. On much less momentous matters the process of making decisions in NATO is complicated, and it should be recognized that such complexity has much to do with the genuine concern of the various NATO powers about the danger of accidentally starting World War III. Such fears will not be diminished with the advent of I.R.B.M.s. In fact, widespread dispersion of nuclear armed missiles raises measurably the possibility of accidental war.

Second, it is quite erroneous to suppose that by contrast with manned bombers the first I.R.B.M.s can be launched almost as simply as pressing a button. Count-down procedures for early

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missiles are liable to interruption, and the characteristics of the liquid oxygen fuel limits the readiness of their response. Unlike JP-4, the fuel used in jet bombers, liquid oxygen cannot be held for long periods of time in these vehicles. In this respect such missiles will be less ready than alert bombers. Third, the smaller warning time available overseas makes more difficult any response. This includes, in particular, any active defense, not only against ballistic missile attacks but, for example, against low altitude or various circuitous attacks by manned aircraft.

Finally, passive defense by means of shelter is more difficult, given the larger bomb yields, better accuracies and larger forces available to the Russians at such close range. And if the press reports are correct, the plans for I.R.B.M. installations do not call for bomb-resistant shelters. If this is so, it should be taken into account in measuring the actual contribution of these installations to the West's retaliatory power. Viewed as a contribution to detering all-out attack on the United States, the Thor and Jupiter bases seem unlikely to compare favorably with other alternatives. If newspaper references to hard bargaining by some of our future hosts are to be believed, it would seem that such negotiations have been conducted under misapprehensions on both sides as to the benefits to the United States.

But many proponents of the distribution of Thor and Jupiter—and possibly some of our allies—have in mind not an increase in U.S. deterrence but the development of an independent capability in several of the NATO countries to deter all-out attack against themselves. This would be a useful thing if it can be managed at supportable cost and if it does not entail the sacrifice of even more critical measures of protection. But aside from the special problems of joint control, which would affect the certainly of response adversely, precisely who their legal owner is will not affect the retaliatory power of the Thors and Jupiters one way or the other. They would not be able to deter an attack which they could not survive. It is curious that many who question the utility of American overseas bases (for example, our bomber bases in the United Kingdom) simply assume that, for our allies, possession of strategic nuclear weapons is one with deterrence.

There remains the view that the provision of these weapons will broaden the range of response open to our allies. In so far as this view rests on the belief that the intermediate-range ballistic missile is adapted to limited war, it is wide of the mark. The inac-

non-true view is Europe!

for retail,
or promotion
(to our FS
members)
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NOT THE
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Ruth: US FS!

curacy of an I.R.B.M. requires high-yield warheads, and such a combination of inaccuracy and high yield, while quite appropriate and adequate against unprotected targets in a general war, would scarcely come within even the most lax, in fact reckless, definition of limited war. Such a weapon is inappropriate for even the nuclear variety of limited war, and it is totally useless for meeting the wide variety of provocation that is well below the threshold of nuclear response. In so far as these missiles will be costly for our allies to install, operate and support, they are likely to displace a conventional capability that might be genuinely useful in limited engagements. More important, they are likely to be used as an excuse for budget cutting. In this way they will accelerate the general trend toward dependence on all-out response and so will have the opposite effect to the one claimed.

Nevertheless, if the Thor and Jupiter have these defects, might not some future weapon be free of them? Some of these defects, of course, will be overcome in time. Solid fuels or storable liquids will eventually replace liquid oxygen, reliabilities will increase, various forms of mobility or portability will become feasible, accuracies may even be so improved that such weapons can be used in limited wars. But these developments are all years away. In consequence, the discussion will be advanced if a little more precision is given such terms as "missiles" or "modern" or "advanced weapons." We are not distributing a generic "modern" weapon with all the virtues of flexibility in varying circumstances and of invulnerability in all-out war. But even with advances in the state of the art on our side, it will remain difficult to maintain a deterrent, especially close in under the enemy's guns.

It follows that, though a wider distribution of nuclear weapons may be inevitable, or at any rate likely, and though some countries in addition to the Soviet Union and the United States may even develop an independent deterrent, it is by no means inevitable or even very likely that the power to deter all-out thermonuclear attack will be widespread. This is true even though a minor power would not need to guarantee as large a retaliation as we in order to deter attack on itself. Unfortunately, the minor powers have smaller resources as well as poorer strategic locations.⁹ Mere membership in the nuclear club might carry with it

⁹ General Gallois argues that, while alliances will offer no guarantee, "a small number of bombs and a small number of carriers suffice for a threatened power to protect itself against atomic destruction." (*Réalités*, op. cit., p. 71.) His numerical illustrations give the defender

since 1942

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prestige, as the applicants and nominees expect, but it will be rather expensive, and in time it will be clear that it does not necessarily confer any of the expected privileges enjoyed by the two charter members. The burden of deterring a general war as distinct from limited wars is still likely to be on the United States and therefore, so far as our allies are concerned, on the military alliance.

There is one final consideration. Missiles placed near the enemy, even if they could not retaliate, would have a potent capability for striking first by surprise. And it might not be easy for the enemy to discern their purpose. The existence of such a force might be a considerable provocation and in fact a dangerous one in the sense that it would place a great burden on our deterrent force which more than ever would have to guarantee extreme risks to the attacker—worse than the risks of waiting in the face of this danger. When not coupled with the ability to strike in retaliation, such a capability might suggest—erroneously, to be sure, in the case of the democracies—an intention to strike first. If so, it would tend to provoke rather than to deter general war.

I have dealt here with only one of the functions of overseas bases: their use as a support for the strategic deterrent force. They have a variety of important military, political and economic rôles which are beyond the scope of this paper. Expenditures in

some 400 underground launching sites (*ibid.*, p. 22, and *The Reporter*, *op cit.*, p. 25) and suggest that their elimination would require between 5,000 and 25,000 missiles—which is “more or less impossible”—and that in any case the aggressor would not survive the fallout from his own weapons. Whether these are large numbers of targets from the standpoint of the aggressor will depend on the accuracy, yield and reliability of offense weapons as well as the resistance of the defender's shelters and a number of other matters not specified in the argument. General Gallois is aware that the expectation of survival depends on distance even in the ballistic missile age and that our allies are not so fortunate in this respect. Close-in missiles have better bomb yields and accuracies. Moreover, manned aircraft—with still better yields and accuracies—can be used by an aggressor here since warning of their approach is very short. Suffice it to say that the numerical advantage General Gallois cites is greatly exaggerated. Furthermore, he exaggerates the destructiveness of the retaliatory blow against the aggressor's cities by the remnants of the defender's missile force—even assuming the aggressor would take no special measures to protect his cities. But particularly for the aggressor—who does not lack warning—a civil defense program can moderate the damage done by a poorly organized attack. Finally, the suggestion that the aggressor would not survive the fall-out from his own weapons is simply in error. The rapid-decay fission products which are the major lethal problem in the locality of a surface burst are not a serious difficulty for the aggressor. The amount of the slow-decay products, strontium-90 and cesium-137, in the atmosphere would rise considerably. If nothing were done to counter it, this might, for example, increase by many times the incidence of such relatively rare diseases as bone cancer and leukemia. However, such a calamity, implying an increase of, say, 20,000 deaths per year for a nation of 200,000,000, is of an entirely different order from the catastrophe involving tens of millions of deaths, which General Gallois contemplates elsewhere. And there are measures that might reduce even this effect drastically. (See the RAND Corporation Report R-322-RC, *Report on a Study of Non-Military Defense*, July 1, 1958.)

MRBM in
 Cuba?

NO! for NATO!

connection with the construction or operation of our bases, for example, are a form of economic aid and, moreover, a form that is rather palatable to the Congress. There are other functions in a central war where their importance may be very considerable and their usefulness in a limited war might be substantial.

Indeed nothing said here should suggest that deterrence is in itself an adequate strategy. The complementary requirements of a sufficient military policy cannot be discussed in detail here. Certainly they include a more serious development of power to meet limited aggression, especially with more advanced conventional weapons than those now available. They also include more energetic provision for active and passive defenses to limit the dimensions of the catastrophe in case deterrence should fail. For example, an economically feasible shelter program might make the difference between 50,000,000 survivors and 120,000,000 survivors.

But it would be a fatal mistake to suppose that because strategic deterrence is inadequate by itself it can be dispensed with. Deterrence is not dispensable. If the picture of the world I have drawn is rather bleak, it could none the less be cataclysmically worse. Suppose both the United States and the Soviet Union had the power to destroy each others' retaliatory forces and society, given the opportunity to administer the opening blow. The situation would then be something like the old-fashioned Western gun duel. It would be extraordinarily risky for one side *not* to attempt to destroy the other, or to delay doing so, since it not only can emerge unscathed by striking first but this is the sole way it can reasonably hope to emerge at all. Evidently such a situation is extremely unstable. On the other hand, if it is clear that the aggressor too will suffer catastrophic damage in the event of his aggression, he then has strong reason not to attack, even though he can administer great damage. A protected retaliatory capability has a stabilizing influence not only in deterring rational attack, but also in offering every inducement to both powers to reduce the chance of accidental war.

The critics who feel that deterrence is "bankrupt" sometimes say that we stress deterrence too much. I believe this is quite wrong if it means that we are devoting too much effort to protect our power to retaliate; but I think it is quite right if it means that we have talked too much of a strategic threat as a substitute for many things it cannot replace.

draft

correctly that such flights had never been undertaken ^{FS!} ~~except~~ in planned exercises and would not be undertaken in response to such ~~unreliable~~ warning. We pointed out the importance of quick response and a high degree of readiness in the protection of the deterrent force. The nature of the fail-safe precaution was also described. 2

We added, however, to cap the argument, that if the Russians were really worried about surprise attack they would accept the President's "open skies" proposal. This addition, however, conceals an absurdity. Aerial photography would have its uses in a disarmament plan—for example, to check an exchange of information on the location of ground bases. However, so far as surprise is concerned, an "open skies" plan would have direct use only to discover attacks requiring much more lengthy, visible and unambiguous preparations than are likely today.¹⁰ The very readiness of our own strategic force suggests a state of technology which outmodes the "open skies" plan as a counter to surprise attack. de Nooy
Not even the most advanced reconnaissance equipment can disclose an intention from 40,000 feet. Who can say what the men in the blockhouse of an I.C.B.M. base have in mind? Or, for that matter, what is the final destination of training flights or fail-safe flights starting over the Pacific or North Atlantic from staging areas? to do FS!

The actions that need to be taken on our own to deter attack might usefully be complemented by bilateral agreements for inspection and reporting and, possibly, limitation of arms and of methods of operating strategic and naval air forces. But the protection of our retaliatory power remains essential; and the better the protection, the smaller the burden placed on the agreement to limit arms and modes of operation and to make them subject to inspection. Reliance on "open skies" alone to prevent surprise would invite catastrophe and the loss of power to retaliate. Such a plan is worthless for discovering a well prepared attack with I.C.B.M.s or submarine-launched missiles or a routine mass training flight whose destination could be kept ambiguous. A tremendous weight of weapons could be delivered in spite of it.

Although it is quite hopeless to look for an inspection scheme which would permit abandonment of the deterrent, this does not

¹⁰ Aerial reconnaissance, of course, could have an *indirect* utility here for surveying large areas to determine the number and location of observation posts needed to provide more timely warning.

VI. DETERRENCE, ACCIDENTS AND DISARMAMENT

Up to now I have talked mainly about the problem of deterring general war, of making it improbable that an act of war will be undertaken deliberately, with a clear understanding of the consequences, that is, rationally. That such deterrence will not be easy to maintain in the 1960s simply expresses the proposition that a surprise thermonuclear attack might not be an irrational or insane act on the part of the aggressor. A deterrent strategy is aimed at a rational enemy. Without a deterrent, general war is likely. With it, however, war might still occur.

WRONG

59 In order to reduce the risk of a rational act of aggression, we are being forced to undertake measures (increased alertness, dispersal, mobility) which, to a significant extent, increase the risk of an irrational or unintentional act of war. The accident problem is serious, and it would be a great mistake to dismiss the recent Soviet charges on this subject as simply part of the war of nerves. In a clear sense the great multiplication and spread of nuclear arms throughout the world, the drastic increase in the degree of readiness of these weapons, and the decrease in the time available for the decision on their use must inevitably raise the risk of accident. The B-47 accidents this year at Sidi Slimane and at Florence, S. C., and the recent Nike explosion are just a beginning. Though incidents of this sort are not themselves likely to trigger misunderstanding, they suggest the nature of the problem.

There are many sorts of accidents that could happen. There can be electronic or mechanical failures of the sort illustrated by the B-47 and Nike mishaps; there can be aberrations of individuals, perhaps quite low in the echelon of command; there can be miscalculations on the part of governments as to enemy intent and the meaning of ambiguous signals. Not all deterrent strategies will involve the risk of accident equally. One of the principles of selecting a strategy should be to reduce the chance of accident, wherever we can, without a corresponding increase in vulnerability to a rational surprise attack. This is the purpose of the "fail-safe" procedures for launching SAC.

These problems are also relevant to the disarmament question. The Russians, exploiting an inaccurate United Press report which suggested that SAC started en masse toward Russia in response to frequent radar "ghosts," cried out against these supposed Arctic flights. The United States response, and its sequels, stated

mean that some partial agreement on inspection and limitation might not help to reduce the chance of any sizable surprise attack. We should explore the possibilities of agreements involving limitation and inspection. But how we go about this will be conditioned by our appreciation of the problem of deterrence itself.

The critics of current policy who perceive the inadequacy of the strategy of deterrence are prominent among those urging disarmament negotiations, an end to the arms race and a reduction of tension. This is a paramount interest of some of our allies. The balance of terror theory is the basis for some of the more light-hearted suggestions: if deterrence is automatic, strategic weapons on one side cancel those of the other, and it should be easy for both sides to give them up. So James E. King, Jr., one of the most sensible writers on the subject of limited war, suggests that weapons needed for "unlimited" war are those which both sides can most easily agree to abolish, simply because "neither side can anticipate anything but disaster" from their use. "Isn't there enough stability in the 'balance of terror,'" he asks, "to justify our believing that the Russians can be trusted—within acceptable limits—to abandon the weapons whose 'utility is confined to the threat or conduct of a war of annihilation'?"¹¹

Indeed, if there were no real danger of a rational attack, then accidents and the "nth" country problem would be the only problems. As I have indicated, they are serious problems and some sorts of limitation and inspection agreement might diminish them. But if there is to be any prospect of realistic and useful agreement, we must reject the theory of automatic deterrence. And we must bear in mind that the more extensive a disarmament agreement is, the smaller the force that a violator would have to hide in order to achieve complete domination. Most obviously, "the abolition of the weapons necessary in a general or 'unlimited' war" would offer the most insuperable obstacles to an inspection plan, since the violator could gain an overwhelming advantage from the concealment of even a few weapons. The need for a deterrent, in this connection too, is ineradicable.

VII. SUMMARY

Almost everyone seems concerned with the need to relax tension. However, relaxation of tension, which everyone thinks is

¹¹ James E. King, Jr., "Arms and Man in the Nuclear-Rocket Era," *The New Republic*, September 1, 1958.

good, is not easily distinguished from relaxing one's guard, which almost everyone thinks is bad. Relaxation, like Miltown, is not an end in itself. Not all danger comes from tension. To be tense where there is danger is only rational.

What can we say then, in sum, on the balance of terror theory of automatic deterrence? It is a contribution to the rhetoric rather than the logic of war in the thermonuclear age. The notion that a carefully planned surprise attack can be checkmated almost effortlessly, that, in short, we may resume our deep pre-sputnik sleep, is wrong and its nearly universal acceptance is terribly dangerous. Though deterrence is not enough in itself, it is vital. There are two principal points.

First, deterring general war in both the early and late 1960s will be hard at best, and hardest both for ourselves and our allies wherever we use forces based near the enemy.

Second, even if we can deter general war by a strenuous and continuing effort, this will by no means be the whole of a military, much less a foreign policy. Such a policy would not of itself remove the danger of accidental outbreak or limit the damage in case deterrence failed; nor would it be at all adequate for crises on the periphery.

A generally useful way of concluding a grim argument of this kind would be to affirm that we have the resources, intelligence and courage to make the correct decisions. That is, of course, the case. And there is a good chance that we will do so. But perhaps, as a small aid toward making such decisions more likely, we should contemplate the possibility that they may *not* be made. They *are* hard, *do* involve sacrifice, *are* affected by great uncertainties and concern matters in which much is altogether unknown and much else must be hedged by secrecy; and, above all, they entail a new image of ourselves in a world of persistent danger. It is by no means *certain* that we shall meet the test.